

mum length. Of course it is not possible to say how much of the deposit has been eroded during past geological ages. And it may also be noted that the depth to which the deposit goes has not yet been ascertained.

The orebody had a known depth of about 2,000 feet measured along its average dip of 45 deg., but the model only shows the orebody to a depth of about 1,600 feet measured along its dip. Diamond drilling ceased about this point, but the last drill cores still showed the presence of ore. The maximum length is about 1,000 feet. The width on the surface is about 180 feet. Between the fifth and sixth levels its width becomes abruptly less, so that on the sixth and eighth levels it has only a width of about 50 feet. Below the eighth level, however, it again becomes wider, and on the tenth it has increased to about 130 feet. Below this the diamond-drill cores show it to be even wider; in fact, wider than in the great open pit on the surface.

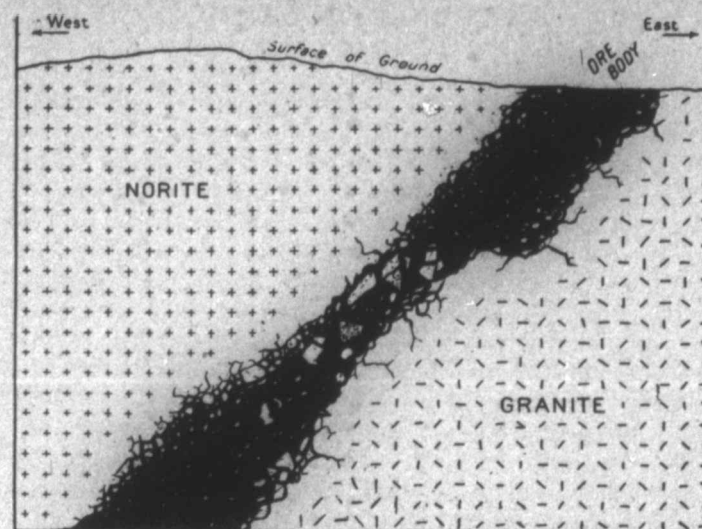
There is a small isolated orebody, near the surface, southward from the main ore. Its relative size and position are shown by the model.

The orebody occurs about at the contact between granite and norite, the latter forming the hanging-wall, the granite the footwall. It has been named a marginal deposit. The orebody, however, is found largely in the granite foot-wall, and it may be said that the limit of the commercial ore is met with when the norite hanging-wall is encountered. Sometimes, indeed, the commercial ore ends before the norite is met with, in which case massive granite forms not only the foot-wall but the hanging-wall. The strike of the orebody is about north and south—really a few degrees east of north. The exact strike on the third, fourth, fifth, sixth, eighth and tenth levels may be seen by consulting the composite plan facing page 144. The dip of the orebody is about 45 deg. to the westward, and there appears to be no change on the lowest parts of the deposit.

An examination of the stopes, crosscuts, drifts and other workings has shown that the orebody consists of a mass of rock fragments cemented together by sulphides. The hand-picked ore contains 4.44 per cent. of nickel and 1.56 per cent. of copper.

It is evident that the formation of the Creighton orebody was preceded by a period of tremendous brecciation and crushing along the contact of granite and norite. That this crushing took place largely in the footwall is shown by the fact that most of the rock fragments in the ore consist of granite and greenstone, while the norite fragments are confined mostly to the vicinity of the hanging-wall. In other words, the commercial orebody occurs in the granite footwall—not in the norite. Sometimes indeed the granite actually forms the hanging-wall as well as the footwall. Generally speaking, it may be stated that, when the norite hanging-wall is met with, the commercial ore comes more or less abruptly to an end.

In searching for an explanation of the origin of the Creighton orebody an observer is soon confronted with the fact that the gravity segregation theory does not appear to be a suitable one. It would seem that it is necessary to fall back on the time-honored theory of deposition from heated solutions. This theory requires little explanation. The crushed nature of the granite footwall and of part of the norite hanging-wall presented an ideal zone for the circulation of heated aqueous solutions. These solutions possibly carried little else than sulphides. It is supposed that they came from great depths, and nearer the surface the sulphides were precipitated, filling the spaces between



Ideal cross-section through Creighton orebody, from the surface to the proposed eighteenth level, showing the nature of the deposit. Black represents ore. The norite is "spotted" with "blebs" of ore, about the size of peas, for 2,000 feet beyond the orebody. This "spotted" norite is not indicated in the drawing except along the edges. The granite is also "spotted" with ore, but to a much less extent than the norite. While the commercial orebody occurs about at the contact of the norite and granite, nevertheless the commercial orebody is found largely in the granite footwall—not in the norite.

the fragments in the crush-breccia and crush-conglomerate. As might be expected, the hanging-wall and footwall and the fragments composing the crush-breccias and crush-conglomerates are more or less replaced or impregnated by sulphides.

THOMAS FROOD'S DISCOVERY.

One of the early prospectors in the Sudbury region was Thomas Frood, who had been a wood ranger in the employ of the Crown Lands Department, and was familiar with the physical features of the Sudbury area. Mr. Frood relates that having heard from one William Nelson, a trapper, that there were indications of mineral on a creek in the northern portion of the township of McKim, he set out on 18th May, 1884, accompanied by A. James Cockburn, another prospector, to examine the locality. He succeeded in locating a vein of pyrites on lot 7 in the sixth concession, and traced it across the boundary to lot 6. A dispute afterwards arose between the two prospectors, which they settled by allotting lot 6 to Cockburn and lot 7 to Frood. Cockburn's claim was transferred to J. H. Metcalf and W. B. McAllister, in whose names the grant issued on 16th July, 1884. Frood took out the patent for the south half of lot 7 in the same month. The mine subsequently opened on this deposit, though not containing the richest ore, has proven to be the largest of the great ore bodies of Sudbury so far developed, and bears the name of Frood, who was a man of education and ability. It is also known as No. 3 mine of the Canadian Copper Company, which now owns the bulk of the deposit. Another of Thomas Frood's discoveries was the Copper Cliff mine, located in 1885.

The first discovery of nickel in Ontario was at the Wallace mine, a short distance west of the point where the Whitefish river enters Lake Huron. No orebody of any consequence has been found there, however.